AMENDMENTS TO THE TITLE:

Please amend the title as follows:

~~METHOD DEVICE FOR~~ TRANSMITTING DATA PACKETS ~~BELONG~~

<u>BELONGING</u> TO DIFFERENT USERS IN A COMMON TRANSMITTAL

PROTOCOL PACKET

1455511

AMENDMENTS TO THE SPECIFICATION:

Please amend the heading beginning at page 1, line 8, as follows:

BACKGROUND ~~OF THE INVENTION~~

Please amend the heading beginning at page 4, line 5, as follows:

~~BRIEF DESCRIPTION OF THE INVENTION~~SUMMARY

Please delete the paragraph beginning at page 4, line 10, which starts with:

This aim is solved...

Please delete the paragraph beginning at page 4, line 13, which starts with:

Advantageous features of the...

Please amend the paragraphs beginning at page 4, lines 16 and 21, as follows:

~~According to the present invention the main aim is to reduce~~ The technology reduces the large overhead encountered when sending short packets such as speech in a local area network, using transmittal protocols such as the MAC protocol, which introduces a large overhead per packet~~[[.]]~~ ~~This aim is solved~~ by collecting several data packets in one data transmittal protocol packet, transmitting this protocol packet, and receiving the protocol packet. ~~wherein each~~ Each of the several data packets ~~are~~ is addressed to a specific ~~destinations~~ destination.

Please amend the paragraph beginning at page 4, line 26, as follows:

The collection and transmittal of several data packets in one transmittal protocol packet, such as a MAC packet, ~~will provide a reduction of~~ reduces the amount of overhead information per transmitted data packet, such as speech, thereby increasing the efficiency by which a radio

channel is used. Also the delay caused by the back-off and SIFS intervals will be reduced, counted on a per packet basis. Also, in the event that a MAC packet has been scheduled to wait long before it is transmitted, which could be the case with DCF in the downlink, it can compensate for this long waiting time by being able to send large amounts of data in its payload.

Please amend the paragraph beginning at page 5, line 4, as follows:

With the ~~present invention~~ technology described in this application, it is possible to use the LAN and WLAN in a multi-access system implementing speech as a data medium transmitted ~~wherein~~ with the drawbacks of the WLAN in connection to speech ~~has been~~ greatly reduced. A more flexible use of existing network media for other and/or ~~complimenting~~ complementing applications ~~of use~~ is obtained.

Please delete the paragraph beginning at page 5, line 10, which starts with:

These and other features...

Please delete the paragraph beginning at page 5, line 15, which starts with:

In the following detailed...

Please amend the paragraph beginning at page 5, line 23, as follows:

Fig. 3   is a schematic view of ~~a~~ an example, non-limiting MAC packet ~~according to the present invention~~, and

Please amend the paragraph beginning at page 5, line 26, as follows:

Fig. 4   shows an example of addressing speech packets ~~according to the present invention~~.

Please amend the heading beginning at page 5, line 29, as follows:

DETAILED DESCRIPTION ~~OF THE INVENTION~~

Please amend the paragraph beginning at page 5, line 30, as follows:

The ~~present invention~~ technology described below relates to transmitting short packages over a LAN network, and in particular a wireless LAN, which packages may be speech packages that generally are rather short and further cannot be delayed for too long before they are transmitted.

Please amend the paragraph beginning at page 6, line 1, as follows:

The ~~general idea is to use the~~ WLAN is used as a communication medium for speech as well as for conventional data transfer. This provides the possibility of having mobile telephone handsets within a building or a local area utilising an existing wireless network, originally intended for wireless connection of computers, printers, modems and the like electronic equipment. Figure 2 shows a schematic example of a wireless communication network having an access point AP and a number of user terminals UT 1-n.

Please amend the paragraph beginning at page 6, line 11, as follows:

In such a network a data transmission protocol, e.g., in the following detailed description ~~–~~ a MAC protocol, is used to transmit data packets between the user terminals and the access point. It comprises a header comprising a destination address, a source address, and a field indicating the type of protocol being carried and ending with a frame check sequence. According to the MAC protocol MAC packets are separated by several time intervals, such as a back-off time, ~~and~~ a shorter inter frame space SIFS, and a distributed inter frame space, DIFS, Fig. 1.

Please amend the paragraph beginning at page 6, line 21, as follows:

~~The idea of the present invention is to collect, for~~ For one or more active users UT1 – UTn, more than one speech packet is collected and ~~insert~~ inserted ~~these~~ into the data field of a MAC packet, at the access point AP, before transmitting it to one or more ~~destination~~ destinations. The data field is thus divided into a number of speech frames, U1 – Um, Fig. 3, where speech packets

from several active user terminals are collected and inserted into the data field, thus "expanding" the data field compared to if only one speech packet ~~would be~~ is inserted.

Please amend the paragraph beginning at page 7, line 1, as follows:

As an example, typically 50 speech packets per second are transmitted to a single user. If there are 10 active users then 500 MAC packets per second need to be transmitted with the conventional method of transmitting one speech packet per MAC packet. With the present ~~invention~~technology, by collecting and transmitting several speech packets per MAC packet, the packets from these 10 active users are collected and inserted together in one MAC packet and, in case one speech packet per user is inserted in the MAC packet, subsequently only 50 MAC packets need to be transmitted. It is thus seen that the overhead/data ratio is reduced by a factor 10. Further reductions are possible if more than one speech packet per user is inserted in the MAC packet. This will however increase the speech packet delay.

Please amend the paragraph beginning at page 7, line 20, as follows:

A few ~~conceivable~~ example methods will be described. In one the existing MAC header is used, where this is set to a broadcast address, wherein the MAC packet is sent to all connected receivers, or is set to a multicast address, wherein the MAC packet is sent to group of predefined receivers, for sorting speech users from data users. For addressing each speech packet in the data field a destination address could be arranged first in the data field indicating that x number of bytes of the speech data belongs to a certain user ID, UT1 in the example of Fig. 4, followed by y number of bytes belonging to another user ID, UT3, etc, or for that matter the same user. In this context it is to be understood that the order also could be the reverse, ie. user ID first and then the number of bytes that belong to that user. If each speech frame was predefined and fixed regarding its byte size, it is possible to omit the number of bytes belonging to each user ID, and to merely have the user ID's in the address field where the speech packet of the first speech frame belongs to the first user ID in the address field, the speech packet of the second speech frame belongs to the second user ID and so on. The user ID could be a MAC address, an IP address or any other identifier that is unique within the network.

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Please amend the paragraph beginning at page 8, line 7, as follows:

The collection of speech packets may be done in different ways such as within a defined time interval, which could be periodic or after a first collected packet. The ~~later~~ latter is suitable when there are delay requirements for packets such as for speech. Other examples of collection principles ~~are that~~ include storing a predetermined number of packets ~~are stored~~, storing packets until a predefined data field size is filled up, and/or storing packets from a predefined number of active users ~~are stored~~ before the MAC packet is transmitted. These properties may be fixed ~~all the time~~ or ~~dynamically~~ dynamically-altered depending on the application and/or load on the network. One example of a data field size is the maximum segment size for the MAC protocol, 2346 bytes. Combinations of collection principles can also be applied, either to send a MAC packet when several criteria are fulfilled or when one of several criteria is fulfilled. For example, ~~to send~~ a MAC packet may be sent when either a defined data size is reached, to minimize overhead, or when a time since first collected data packet has elapsed[[,]] to ~~still~~ fulfil a delay requirement.

Please amend the paragraph beginning at page 9, line 15, as follows:

~~It is~~ In a further ~~conceivable to implement the present invention such that~~ implementation example, speech packets from active users are stored in individual buffers that are connected to individual inputs of a time multiplex unit that at its output generates lumped or multiplexed speech packets.

Please amend the paragraph beginning at page 9, line 20, as follows:

~~The present invention of collecting~~ Collecting speech packets from several active users also has the advantage, apart from reducing the overhead/data ratio, i.e. increasing the capacity, that it improves the transmission of packets in a WLAN with distributed coordination function, DCF, wherein the access point, having one random number trying to access the downlink, has to compete with several active mobile terminals on the network, all having the same probability. When the access point gets access to transmit, it actually sends data, speech packets, to several users in one transmission instead of only one user as with the conventional way. Thereby the reduced access probability per user in the downlink is counteracted.

Please amend the paragraph beginning at page 9, line 32, as follows:

Normally, in transmitting data over a LAN using MAC protocol, an acknowledgement, ACK, is sent back to the transmitter that the packet has been received. With the ~~present invention~~ technology here and a normal MAC packet configuration it is difficult to send an ACK, since different parts of the data field ~~is~~ are received by different destinations. Further, according to the IEEE 802.11 standard, regarding wireless LANs, no ACKs are sent in response to broadcast or multicast messages. ~~Either the method according to the invention~~ One could accept that no ACKs are sent, ~~this~~ which is often the case for speech transmitting systems, like GSM, or the MAC protocol could be modified allowing introduction of ACKs, for example, by letting users contend for the uplink using normal or modified channel access procedures when transmitting ACKs.

Please amend the paragraph beginning at page 10, line 12, as follows:

The transmittal packet containing several user packets could further be given priority by using any ~~therefore~~ available means in the communication network. In for example 802.11 wireless LAN, a shorter interframe space than DIFS could be used, or on average, shorter back-off timers.

Pleas amend the paragraph beginning at page 10, line 24, as follows:

It is to be understood that the embodiments described above and shown in the drawings only are to be regarded as non-limiting examples. ~~of the invention and that it may be modified within the scope of protection~~ The invention is defined by the patent claims.